

Product Data Sheet

Product Name: Oryzalin
Cat. No.: GC64626

Chemical Properties

Cas. No. 19044-88-3

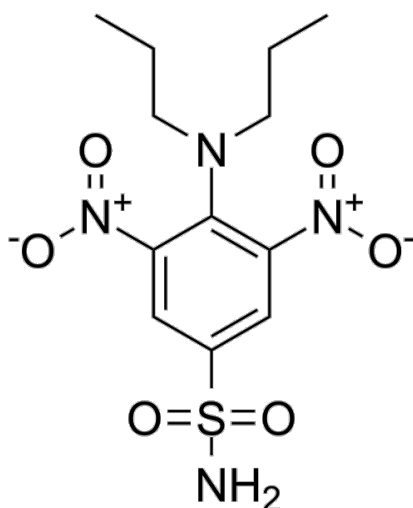
Formula $C_{12}H_{18}N_4O_6S$ M.Wt 346.36

Solubility DMSO : 250 mg/mL (721.79 mM; Need ultrasonic) Storage Store at -20°C

General tips For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.

Structure



Protocol

Caution: Product has not been fully validated for medical applications. For research use only.

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Cell experiment [1]:

Cell lines	J774 mouse macrophages, PC3 human prostate cancer cells
Preparation Method	J774 macrophages were maintained in DMEM supplemented with 10% heat-inactivated fetal calf serum, 2.0mM L-glutamine, 50units/mL penicillin and 50µg/mL streptomycin. PC3 cells were maintained in RPMI 1640 with the same supplements. Both cell types were incubated at 37°C, 5% CO ₂ . Cells were seeded at 10 ⁴ cells/mL (100µL per well) in 96-well plates. Cells were treated with Oryzalin.
Reaction Conditions	0.41–31µM; 72h
Applications	Oryzalin inhibited the proliferation of J774 mouse macrophages and PC3 human prostate cancer cells with IC ₅₀ values of 28±4µM and 31±8µM.

Animal experiment [2]:

Animal models	Neonatal Swiss ARC mice, Wistar neonatal rats, each inoculated with 10 ⁵ viable <i>Cryptosporidium parvum</i> oocysts
Preparation Method	Animals received Oryzalin via gastric intubation at 12-h intervals for 3 days starting from day 4 post-infection, with 6 doses in total. All animals were sacrificed on day 7 post-infection, and gut contents were collected to determine oocyst load.
Dosage form	100mg/kg; gastric intubation; twice daily for 3 days (6 total doses)
Applications	Oryzalin at 100mg/kg caused 90% inhibition of oocysts recovered from the gut of infected neonatal Swiss ARC mice and 79% inhibition in infected Wistar neonatal rats.

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References:

- [1] Bhattacharya G, Herman J, Delfin D, et al. Synthesis and antitubulin activity of N1- and N4-substituted 3,5-dinitro sulfanilamides against African trypanosomes and Leishmania. J Med Chem. 2004 Mar 25;47(7):1823-32.
- [2] Armson A, Sargent K, MacDonald LM, et al. A comparison of the effects of two dinitroanilines against *Cryptosporidium parvum* in vitro and in vivo in neonatal mice and rats. FEMS Immunol Med Microbiol. 1999 Nov;26(2):109-13.

Background

Oryzalin is a dinitroaniline herbicide. Oryzalin binds to plant tubulin and inhibits microtubule polymerization, thereby blocking mitosis and suppressing weed seedling growth. Oryzalin can be used in studies related to weed control and plant chromosome engineering^[1-4].

In vitro, Oryzalin (0.1, 1, 10, 50µM) was applied to rice Nihon-Masari wild-type and ER31d suspension cells for 1–8 days. Oryzalin dose-dependently reduced cell viability, caused cell swelling and loss of anisotropy, and eliminated cortical microtubule arrays^[5]. Oryzalin (0.41–31µM) was applied to *Trypanosoma brucei* variant 221 bloodstream forms, *Leishmania donovani* axenic amastigotes, J774 mouse macrophages, and PC3 human prostate cancer cells for 72h. Oryzalin inhibited the proliferation of *T. brucei* variant, *L. donovani* axenic amastigotes, J774 cells, and PC3 cells^[6].

In vivo, Oryzalin (100mg/kg; every 12h) was administered by gastric intubation to neonatal Swiss ARC mice and Wistar neonatal rats inoculated with *C. parvum* oocysts for 3 days with a total of 6 doses. Oryzalin reduced the number of oocysts recovered from the guts of mice and rats^[7]. Oryzalin (300–2000mg/kg; once daily) was administered by oral gavage or subcutaneous injection to C57Bl/6 mice bearing B16 melanoma tumors, starting 1 day after tumor inoculation for 3–10 days; Oryzalin (150–600mg/kg; once daily) was administered by subcutaneous or intraperitoneal injection to CD1 Nu/Nu mice bearing VRC5, CX-1, or HT-29 colon cancer xenografts, starting 7–14 days after tumor inoculation for 10 days. Oryzalin significantly inhibited the growth of B16 melanoma, while Oryzalin showed no obvious inhibitory effect on colon cancer xenografts^[8].

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- [1] Chen J, Yu Q, Patterson E, et al. Dinitroaniline Herbicide Resistance and Mechanisms in Weeds. *Front Plant Sci.* 2021 Mar 25;12:634018.
- [2] Singh B, Yun S, Gil Y, et al. The Role of Colchicine in Plant Breeding. *Int J Mol Sci.* 2025 Jul 14;26(14):6743.
- [3] Basit A, Lim KB. Systematic approach of polyploidy as an evolutionary genetic and genomic phenomenon in horticultural crops. *Plant Sci.* 2024 Nov;348:112236.
- [4] Gantait S, Mukherjee E. Induced autopolyploidy-a promising approach for enhanced biosynthesis of plant secondary metabolites: an insight. *J Genet Eng Biotechnol.* 2021 Jan 8;19(1):4.
- [5] Morettini S, Gianì S, Nick P, et al. Two anti-microtubular drugs for two differential responses: a rice cell line resistant to EPC remains susceptible to oryzalin. *Plant Physiol Biochem.* 2013 Feb;63:107-14.
- [6] Bhattacharya G, Herman J, Delfín D, et al. Synthesis and antitubulin activity of N1- and N4-substituted 3,5-dinitro sulfanilamides against African trypanosomes and Leishmania. *J Med Chem.* 2004 Mar 25;47(7):1823-32.
- [7] Armson A, Sargent K, MacDonald LM, et al. A comparison of the effects of two dinitroanilines against *Cryptosporidium parvum* in vitro and in vivo in neonatal mice and rats. *FEMS Immunol Med Microbiol.* 1999 Nov;26(2):109-13.
- [8] Mara C, Dempsey E, Bell A, et al. Synthesis and evaluation of phosphoramidate and phosphorothioamidate analogues of amiprophos methyl as potential antimalarial agents. *Bioorg Med Chem Lett.* 2011 Oct 15;21(20):6180-3.

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